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Thermodynamic properties of electrons in quasi-periodic structures

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Abstract

© 2016 Author(s).The purpose of this study was investigating the specific heat properties of electrons in one dimensional quasiperiodic potentials. The electronic energy spectra were obtained from the monoscale Cantor set. The exact analytical results on the temperature dependence of the electron's specific heat associated with their fractal energy spectra are presented. A log-periodic behavior in low-temperature and nonoscillatory behavior in high-temperature regions was found for the specific heat. The exact value of the limiting temperature determining the boundary between these two regions was obtained.

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